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Haystack Pointing System: Scan	
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HAYSTACK POINTING SYSTEM: SCAN

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ABSTRACT

As one of its options, the Haystack Pointing system can superpose a scan on any other pointing task. The available scans include both simple one-dimensional scans and area-covering scans.

HAYSTACK POINTING SYSTEM: SCAN

INTRODUCTION

The antenna pointing program for the Haystack Univac 490 computer includes provisions for superposing a variety of possible scans on any of the normal computer-directed antenna pointing modes.   The center position of such scanning follows the computed position of the selected target.   A description of the possible scans and the program which implements them follows.

PROGRAM INPUTS

    1.   Time (DSECONDS)

    2.   Computed Right Ascension (RA)

    3.   Computed Declination (DEC)

    4.   Computed Azimuth (AZ)

    5.   Computed Elevation (EL)

    6.   Sine and Cos of Track Angle (described below)

    7.   Complex interaction with an operator via the keyboard and its servicing program "INTERCOM".

Since the main pointing program must have RA and DEC to compute AZ and EL, the scan program is actually called twice, once to scan in RA-DEC and once in AZ-EL. The master control program believes there are two scan programs called AESCAN (for Azimuth-Elevation Scan) and RDSCAN (Right-Ascension-Declination Scan). Actually there are just two entries to one program.
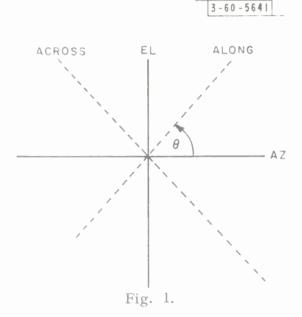
PROGRAM OUTPUTS

    1.   Right Ascension with Scan Added

    2.   Declination with Scan Added

    3.   Azimuth with Scan Added

    4.   Elevation with Scan Added

COORDINATES

The Scan program recognizes 6 coordinate axes. These are Azimuth, Elevation, Right Ascension, Declination, Along Track, and Across Track. Across Track is

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orthogonal to Along Track and the radius vector, and the remainder are self explana-
tory. For the most part these are treated as similar but independent axes. For
example, there is one subroutine which computes a simple back and forth scan, and
this subroutine is used six times to get six different scans. For some area-type scans
two axes are involved. Again there is only one subroutine involved, but it now provides
a pair of displacements which are added to one of the three coordinate pairs. When
order of the pair is considered, there are 6 possible scans from this subroutine.

Since Along Track and Across Track are not normal system axes, scans along
these axes must be converted to Azimuth and Elevation displacements. This is done
using the knowledge of the angle between the two axis-pairs (See Fig. 1).

Fig. 1.

The Sine and Cos of the angle θ in the figure are among the inputs to the program, if
AL and AC are the displacements in Along and Across, then

$$AZ = AL \cos \theta - AC \sin \theta$$
$$EL = AL \sin \theta + AC \cos \theta$$

The implementation of Along — Across in AZ-EL instead of in RA-DEC was a choice of
the lesser of evils. In AZ-EL one specified directly the radar angular rate and angular
extent of the scan. In RA-DEC, for approximately circular orbits, one specifies
quantities more closely related to the velocity in n. m. /sec and extent in n. m. In
neither case is one scanning in range to stay on the track in that variable.

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As scan is constructed, it is impossible to scan in AZ-EL and Along-Across simultaneously.

The axes are related in one further way, which involves the phase of the scans. Time is the key variable for determining the next step in the scan process, and is arranged so that a time of zero corresponds to the low end of the scan. In order to start a scan at a particular place (the center for example) a constant called "Time Zero" is subtracted from time before the various routines are called. There are only two such constants, one for AZ-EL or Along-Across and one for RA-DEC. This has the effect of forcing simultaneous scans in AZ and EL (or RA and DEC) to have the same time zero, or phase, which means there will probably be a discontinuity in one scan when the second is initialized.

BACK AND FORTH SCAN

The "back and forth" Scan is the basic scan. It is used as six different scan options (one for each coordinate axis), and is also used as a component of the Area-Oriented "Box Scans." See Fig. 2 for a sketch of this basic scan.
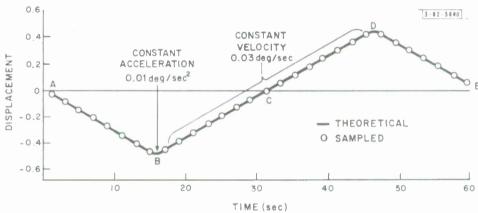

Fig. 2. Example of one full period of the basic BACK AND FORTH scan.

The back and forth scan is computed in 4 symmetrical sections, (AB, BC, CD, DE in Fig. 2) each section consisting of a period of constant acceleration and a period of constant velocity. The acceleration is always for three seconds,* unless the total

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*3 secs of max. antenna acceleration produces maximum antenna velocity.

time available is less than 3 seconds per section, in which case the acceleration is continuous through the whole scan. The acceleration is computed so that the scan is completed in the allotted period:

$$1/2\ a(3)^2 + 3a(p/4 - 3) = A \qquad p > 12$$

or
$$1/2\ a(p/4)^2 = A \qquad p \leq 12$$

where a = acceleration

A = half Arc (Amplitude) of scan

p = period of scan

The constant velocity of course is 3a.

Simplifying and solving for a:

$$a = \frac{4}{3} \cdot \frac{A}{p-6} \qquad p > 12$$

$$a = \frac{32A}{p^2} \qquad p \leq 12$$

In actuality, scan does not produce a continuous output, but rather discrete points every interpolation interval. Whether scan actually follows the desired curve depends on a complex interaction with the interpolation program and the antenna servo.

The program that computes a back and forth scan compares time* to period to discover where it is on the scan. It then divides the scan into two similar half scans (increasing and decreasing) which are processed by a single subroutine. This sub-routine further divides each half scan into two quarter scans processed by a second subroutine.

That routine divides the quarter into an accelerating part and a coasting part using the formulas above to determine velocity and acceleration, and computes actual position. The output of the "BACK AND FORTH" routine is a displacement which will be added to the appropriate center position to create a scan.

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*Remember that the zero of time has been set artificially to start the scan at its center.

BOX SCAN

The "Box Scan" is an area-covering scan. It is used in 3 different coordinate systems, and applied in 2 different ways in each system. The output of the BOX SCAN routine is two values, which produce a Box-Like scan when added to the appropriate center positions. Figure 3 is a sketch of this basic scan.

The comments under back and forth scan about the discrete spacing of the actual scan output apply here also, and in fact the BOX SCAN does a back and forth scan in one coordinate while simply stepping the other coordinate at the end points. This discontinuity in the second coordinate produces an error as the antenna servo tries to cope with infinite acceleration, but it was felt that the step would be small and relatively infrequent, so that the transient would not matter. At the end of the box the whole scan repeats, causing another transient as the antenna moves back to the initial corner of the box. There is no limit to the number of lines per box, and the number may be odd or even. The illustration (Fig. 4) is perhaps unrealistic in having so few lines (4) but more present a bit of a drawing problem.

The Box Scan program compares time to the overall period to determine location in the scan. It then uses that part of the back and forth routine which processes half a period (one line) to get displacement 1 and computes the simpler displacement 2 itself.

CONVENIENCE SCANS

There are a number of scan options which are not really scans but are included here for lack of a more appropriate place. They include constant offsets, which are simply added to the center positions before any other action; holding all scans, which is accomplished by presenting the scans with a phony time set at the time of the hold; restarting which undoes the hold and moves the time origin so that the scan picks up where it left off; and clearing all scans.

INTERNAL LOGIC

This section presents in a more organized way the block diagram implied by the discussion above, and includes a list of key registers with their actual program names.
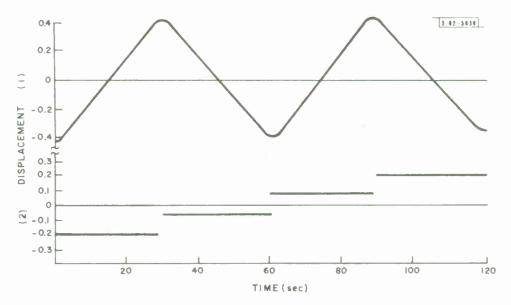
Fig. 3. Example of one full period of the box scan.

Time per Line   = 30 sec
Lines per Box = 4 (normally one would use more, but it clutters
                       the picture)
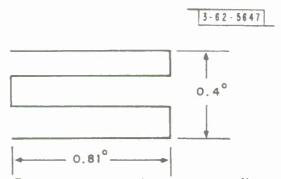Length of Box   = .81 degrees
Line Spacing   = .133 degrees

Fig. 4. Box scan as seen in space coordinates.

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AZ-EL Entry
|
Move Input AZ-EL
To Output AZ-EL, Adding
AZ, EL, Along, and Across
Offsets in the Process
|
Compute Internal Time
|
Do AZ SCAN if requested (use BACK AND FORTH)
|
Do EL SCAN if requested (use BACK AND FORTH)
|
Do AZ-EL BOX SCAN if requested (use BOX SCAN)
|
If AZ-EL is Really Along-Across rotate the above answers through the angle θ
|
Add the Scans into the output
|
Return

RA-DEC Entry
|
Move Input RA-DEC to Output RA-DEC, adding RA and DEC Offsets in the process
|
Compute Internal Time
|
Do RA Scan If Requested (use BACK AND FORTH)
|
Do DEC Scan If Requested (use BACK AND FORTH)
|
Do RA-DEC BOX SCAN If Requested (use BOX SCAN)
|
Add the Scans into the Output
|
Return

BACK AND FORTH: Break the scan in half and use LINE
LINE: Break the line in half and use LINEX

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LINEX: $a = 4/3 \dfrac{A}{p-6}$ $p > 12$

$\dfrac{8A}{p}$ $p \le 12$

displacement $= 1/2\, a(T)^2$ $T \le 2$

$1/2\, a3^2 + 3a(T-3)$ $T > 2$

where $T =$ Time from the acceleration end of the half line.

BOXSCAN: Compute displacement 1 using LINE

Compute displacement 2

KEY REGISTERS

NAME	MEANING
M1	0 means no AZ-EL box scan
M2	0 means no AZ scan
M3	0 means no EL scan
M4	0 means no RA-DEC box scan
M5	0 means no RA scan
M6	0 means no DEC scan
M7	1 means AZ-EL is really along-across
M8	0 means lines along AZ in AZ-EL box
M9	0 means lines along RA in RA-DEC box
M10	1 means hold scan
KKAL	Azimuth offset in revolutions B27
KKEL	Elevation offset in revolutions Ba7
KKRL	RA offset in revolutions B27
KKDL	DEC offset in revolutions B27
KKCL	Across offset in revolutions B27
KKLL	Along offset in revolutions B27
KAT	Azimuth period in seconds
KET	Elevation period in seconds
KDT	DEC period in seconds

NAME	MEANING
KRT	RA period in seconds
KAL	Azimuth whole arc length in revolutions B27
KEL	Elevation whole arc length in revolutions B27
KDL	Declination whole arc length in revolutions B27
KRL	RA whole arc length in revolutions B27
NULL	Time origin for RA-DEC scans
NULLY	Time origin for AZ-EL scans
AEBOX	Total time per box in seconds (AZ-EL)
+ 1	Box length in revolutions B27 (AZ-EL)
+ 2	Number of lines per box (AZ-EL)
+ 3	Line spacing in revolutions B27 (AZ-EL)
+ 4	Time per line in sec (AZ-EL)
+ 5	0 means lines along AZ in AZ-EL box (AZ-EL)
RD BOX	Like AE BOX

INITIALIZATION

The function of initialization is to set up the 38 key registers described in the Logic Section, so that the operating part of the program can do its job. Mostly, initialization simply asks the operator for each number it should use. See Appendix A for a complete run through of all the possible scan questions with typical answers.

Initialization is called in two different modes by the master control program. In Mode 1 it performs the clear all scan function, an option which is also available to the operator. (This amounts to zeroing registers M∅ through M10.) In Mode 2 initialization asks the operator to set up a scan: when he has done so, it asks for another, and so on indefinitely. Mode 1 is used when master control wants to start over. Mode 2 when scan has been requested via the attention symbol.

When a scan is selected initialization must set the appropriate zero point of time. This is done by putting either the current time or current time plus a quarter period in the appropriate zero register. It is probable that one will be off by a second or two, because there is an unknown delay between the time of striking a key and the operation of scan initialization, and a further unknown delay between scan initialization

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and scan operation. When a scan is "held" initialization tries as best it can to stop at the time of the struck key, but there is an obvious difficulty, compounded by the fact that the system is 6 seconds ahead of real time. (This is not the appropriate place to discuss the complex subject of system timing - I merely wish to explain why the hold option is not a good way to come to a precise stop.)

It is possible to ask for an unreasonable acceleration, for example by selecting a zero period. Whenever this might occur, initialization computes the period corresponding to a $3^o/\text{sec}^2$ acceleration. ($p = 6 + \frac{4}{9}A$ $A > \frac{27}{2}$, $p = 4\sqrt{2/3\ A}$ $A < 27/2$. If the chosen period is too small initialization uses the computed period and tells the operator what has happened.

Initialization rounds all odd periods to the next lower even period, for internal convenience.

If one asks for a zero spacing of lines in a box, initialization will substitute one beamwidth. This is perhaps of some convenience in the AZ-EL Box Scan.

APPENDIX   A

❀

SIGN OFF(1) MOD(2) NEXT RUN(3) PRINT(4)   2*

AZ-EL(1) DATA PROCESSING(2) SCAN(3) RECORDING(4) TIMING(5) OTHER(6)
     3*

SELECT SCAN OR OFFSET
CLEAR(0),HOLD(1),RESUME(2)
AZSCAN(3),ELSCAN(4),AZELBOX(5),AZOFFSET(6),ELOFFSET(7)
RASCAN(8),DECSCAN(9),RADECBOX(10),RAOFFSET(11),DECOFFSET(12)
ORBIT- CROSSCAN(13),ALONGSCAN(14),BOX(15),CROSSOFFSET(16),ALONGOFFSET(17)
DRIFT SCAN(18) 0*

CLEARED-RESELECT AT WILL 1*

HELD-RESELECT AT WILL 2*

RESUMED-RESELECT AT WILL 3*

AZ SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 4*

EL SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 5*

AE BOX SCAN

ARC IN DEGREES 1*

LINES PER BOX = 10*

SPACING IN DEG= .25*

TIME/LINE(SEC)= 10*

LINES PARALLEL TO AZ(0),EL(1) 0*

SCANNING-RESELECT AT WILL 6*

AZ OFFSET IN DEGREES 10*

OFFSET-RESELECT AT WILL 7*

EL OFFSET IN DEGREES 10*

OFFSET-RESELECT AT WILL 8*

RA SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 9*

DEC SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

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SCANNING-RESELECT AT WILL   10*
RA-DEC BOX SCAN
ARC IN DEGREES   1*
LINES PER BOX =   10*
SPACING IN DEG=   .25*
TIME/LINE(SEC)=   10*
LINES PARALLEL TO RA(0),DEC(1)   0*
SCANNING-RESELECT AT WILL   11*
RA OFFSET IN DEGREES   45*
OFFSET-RESELECT AT WILL   12*
DEC OFFSET IN DEGREES   25*
OFFSET-RESELECT AT WILL   13*
ACROSS SCAN
PERIOD IN SEC =   30*
HALF-ARC IN DEGREES   1*
SCANNING-RESELECT AT WILL   14*
ALONG   SCAN
PERIOD IN SEC =   30*
HALF-ARC IN DEGREES   1*
SCANNING-RESELECT AT WILL   15*
AL-ACR BOX SCAN
ARC IN DEGREES   1*
LINES PER BOX =   10*
SPACING IN DEG=   .25*
TIME/LINE(SEC)=   10*
LINES PARALLEL TO ORBIT(0),ACROSS ORBIT(1)   0*
SCANNING-RESELECT AT WILL   16*
CROSS-ORBIT OFFSET (DEG)   45*
OFFSET-RESELECT AT WILL   17*
ALONG-ORBIT OFFSET (DEG)   30*
OFFSET-RESELECT AT WILL   18*
RA OFFSET IN DEGREES   45*
DEC OFFSET IN DEGREES   45*
CARRIAGE RETURN TO START DRIFT SCAN   *
DRIFTING-RESELECT AT WILL
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                        SCAN               CROWTHER*4APR66

CARDS    L1 ID LABEL    TA STATEMENT                          LOC    F JKB Y        NOTES

   .    00000 SCAN        PROGRAM    CROWTHER*4APR66
   .    00001 SCANX       U-TAG      SCAN1*SCAN             00000  00760 00003
   .    00002             FD    1*ADSCN                     00001  06113 01023
   .    00003 IC          EQUALS     INTERCOM
   .    00004 TT          0     0                           00002  00000 00000
   .    00005 TYME        EQUALS     DSECONDS
   .    00006 AZ1         EQUALS     AZIM
   .    00007 AZ2         EQUALS     SAZIM
   .    00010 EL1         EQUALS     ELEV
   .    00011 EL2         EQUALS     SELEV
   .    00012 RA1         EQUALS     RA
   .    00013 RA2         EQUALS     SRA
   .    00014 DN1         EQUALS     DEC
   .    00015 DN2         EQUALS     SDEC
   .    00016 ANS         EQUALS     SINAZEL
   .    00017 ANC         EQUALS     COSAZEL
   .    00020 M1          EQUALS     AZELBXSCAN
   .    00021 M2          EQUALS     AZMTHSCAN
   .    00022 M3          EQUALS     ELVTNSCAN
   .    00023 M4          EQUALS     RADCBXSCAN
   .    00024 M5          EQUALS     RASCTNSCAN
   .    00025 M6          EQUALS     DECLINSCAN
   .    00026 M7          EQUALS     ALNGACRSCN
   .    00027 M8          EQUALS     AEBOXLINES
   .    00030 M9          EQUALS     RDBOXLINES
   .    00031 M10         EQUALS     HOLDNOHOLD
   .    00032 KKAL        EQUALS     AZIMOFFSET
   .    00033 KKEL        EQUALS     ELEVOFFSET
   .    00034 KKRL        EQUALS     RAOFFSET
   .    00035 KKDL        EQUALS     DECOFFSET
   .    00036 KKCL        EQUALS     CRSSOFFSET
   .    00037 KKLL        EQUALS     ALNGOFFSET
   .    00040 TOME        EQUALS     TIMETOHOLD
   .    00041 KET         EQUALS     PERIODELEV
   .    00042 KEL         EQUALS     ARCOFELEV
   .    00043 KAT         EQUALS     PERIODAZIM
   .    00044 KAL         EQUALS     ARCOFAZIM
   .    00045 KDT         EQUALS     PERIODDEC
   .    00046 KDL         EQUALS     ARCOFDEC
   .    00047 KRT         EQUALS     PERIODRA
   .    00050 KRL         EQUALS     ARCOFRA
   .    00051 NULL        EQUALS     RADECOTIME
   .    00052 NULLY       EQUALS     AZELOTIME
   .    00053 SCAN        JP    0                           00003  61000 00000   MASTER CONTROL ENTRY
   .    00054             ADD   A*0*ANOT                    00004  20500 00000
   .    00055             JP    MCR                         00005  61000 00012
   .    00056             CL    W(DRIFTFLAG)                00006  16030 02121
   .    00057             CLEAR     16D*M1                  00007  70100 00020
                                                           00010  16030 63500
   .    00060             JP    SCAN                        00011  61000 00003
   .    00061 MCR         RJP   U(IC)                       00012  65020 63426
   .    00062             U-TAG     U0HND*I01               00013  02017 01337
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```
.   00063 MCQQ        ENT  B7*L(KIND)        00014  12710 01263
.   00064             JP   L(JPTAB+B7)       00015  61017 00016
.   00065 JPTAB       0    MC0               00016  00000 00041  CLEAR
.   00066             0    MC10              00017  00000 00506  HOLD
.   00067             0    MC13              00020  00000 00515  RELEASE
.   00070             0    MC1               00021  00000 00047  A SCAN
.   00071             0    MC2               00022  00000 00100  E SCAN
.   00072             0    MC3               00023  00000 00127  AE-BOX
.   00073             0    MC14              00024  00000 00525  AZ OFFSET
.   00074             0    MC15              00025  00000 00533  EL OFFSET
.   00075             0    MC4               00026  00000 00206  R SCAN
.   00076             0    MC5               00027  00000 00236  D SCAN
.   00077             0    MC6               00030  00000 00266  RD-BOX
.   00100             0    MC16              00031  00000 00541  RA OFFSET
.   00101             0    MC17              00032  00000 00551  DEC OFFSET
.   00102             0    MC7               00033  00000 00346  AC SCAN
.   00103             0    MC8               00034  00000 00376  AL SCAN
.   00104             0    MC9               00035  00000 00426  AA-BOX
.   00105             0    MC18              00036  00000 00561  AC OFFSET
.   00106             0    MC19              00037  00000 00567  AL OFFSET
.   00107             0    MC20              00040  00000 00577  DRIFT SCAN
.   00110 MC0         CLEAR    16D*M1        00041  70100 00020
.                                            00042  16030 63500
.   00111             CL   W(M11)            00043  16030 02124
.   00112             RJP  U(IC)             00044  65020 63426
.   00113             U-TAG    FR11A*I01     00045  02021 01337
.   00114             JP   MCQQ              00046  61000 00014
.   00115 MC1         RJP  U(IC)             00047  65020 63426
.   00116             U-TAG    S02*0         00050  01343 00000
.   00117             RJP  U(IC)             00051  65020 63426
.   00120             U-TAG    S51*I02       00052  01345 01347
.   00121             RJP  U(IC)             00053  65020 63426
.   00122             U-TAG    S03*I03       00054  01351 01353  ARC LENGTH  (ZZ2)
.   00123             ENT  A*W(TYME)         00055  11030 63141
.   00124             STR  A*W(NULLY)        00056  15030 63532
.   00125             ENT  Q*W(ZZ22)         00057  10030 01274
.   00126             LSH  Q*1               00060  05000 00001
.   00127             MUL  2660266000        00061  22030 02126
.   00130             STR  A*W(ZZ2)          00062  15030 01267
.   00131             CL   W(M1)             00063  16030 63500
.   00132             ENT  Q*W(ZZ2)          00064  10030 01267
.   00133             ENT  A*W(ZZ1)          00065  11030 01266
.   00134             RJP  FIXZERO           00066  65000 01074
.   00135             RSH  A*1               00067  02000 00001
.   00136             LSH  A*1               00070  06000 00001
.   00137             CL   W(M2)             00071  16030 63501
.   00140             STR  A*W(KAT)          00072  15030 63523
.   00141             STR  Q*W(KAL)          00073  14030 63524
.   00142             STR  Q*W(M2)           00074  14030 63501
.   00143 MCG3        RJP  U(IC)             00075  65020 63426
.   00144             U-TAG    FR14*I01      00076  02027 01337
.   00145             JP   MCQQ              00077  61000 00014
.   00146 MC2         RJP  U(IC)             00100  65020 63426
.   00147             U-TAG    S04*0         00101  01355 00000
.   00150             RJP  U(IC)             00102  65020 63426
.   00151             U-TAG    S51*I02       00103  01345 01347
.   00152             RJP  U(IC)             00104  65020 63426
.   00153             U-TAG    S03*I03       00105  01351 01353  ARC LENGTH  (ZZ2)
.   00154             ENT  A*W(TYME)         00106  11030 63141
```

```
•  00155           STR  A*w(NULLY)        00107  15030 63532
•  00156           ENT  Q*w(ZZ22)         00110  10030 01274
•  00157           LSH  Q*1               00111  05000 00001
•  00160           MUL  2660266000        00112  22030 02126
•  00161           STR  A*w(ZZ2)          00113  15030 01267
•  00162           CL   W(M1)             00114  16030 63500
•  00163           ENT  Q*w(ZZ2)          00115  10030 01267
•  00164           ENT  A*w(ZZ1)          00116  11030 01266
•  00165           RJP  FIXZERO           00117  65000 01074
•  00166           RSH  A*1               00120  02000 00001
•  00167           LSH  A*1               00121  06000 00001
•  00170           CL   W(M3)             00122  16030 63502
•  00171           STR  A*w(KET)          00123  15030 63521
•  00172           STR  Q*w(KEL)          00124  14030 63522
•  00173           STR  Q*w(M3)           00125  14030 63502
•  00174           JP   MCQ3              00126  61000 00075
•  00175 MC3       RJP  U(IC)             00127  65020 63426
•  00176           U-TAG   S14*0          00130  01367 00000
•  00177           RJP  U(IC)             00131  65020 63426
•  00200           U-TAG   S52*I14        00132  01371 01373  LENGTH      221
•  00201           RJP  U(IC)             00133  65020 63426
•  00202           U-TAG   S15*I15        00134  01375 01377  NUM LINES   ZZ2
•  00203           RJP  U(IC)             00135  65020 63426
•  00204           U-TAG   S16*I16        00136  01401 01403  LINE SPACING  ZZ3
•  00205           RJP  U(IC)             00137  65020 63426
•  00206           U-TAG   S17*I17        00140  01405 01407  TIME/LINE   ZZ4
•  00207           RJP  U(IC)             00141  65020 63426
•  00210           U-TAG   S18*I18        00142  01411 01413  AXIS 0 OR 1  ZZ5
•  00211           ENT  A*w(TYME)         00143  11030 63141
•  00212           STR  A*w(NULLY)        00144  15030 63532
•  00213           ENT  Q*w(ZZ11)         00145  10030 01273
•  00214           MUL  2660266000        00146  22030 02126
•  00215           STR  A*w(ZZ1)          00147  15030 01266
•  00216           ENT  Q*w(ZZ33)         00150  10030 01275
•  00217           MUL  2660266000        00151  22030 02126
•  00220           STR  A*w(ZZ3)          00152  15030 01270
•  00221           ENT  A*w(ZZ3)*ANOT     00153  11530 01270
•  00222           ENT  A*44400           00154  11000 44400  BEAMWIDTH
•  00223           STR  A*w(ZZ3)          00155  15030 01270
•  00224           ENT  Q*w(ZZ1)          00156  10030 01266
•  00225           ENT  A*w(ZZ44)         00157  11030 01276
•  00226           RJP  FIXZERO           00160  65000 01074
•  00227           STR  A*w(ZZ4)          00161  15030 01271
•  00230           ENT  Q*w(ZZ2)          00162  10030 01267
•  00231           MUL  W(ZZ4)            00163  22030 01271
•  00232           ADD  Q*1               00164  26000 00001
•  00233           RSH  Q*1               00165  01000 00001
•  00234           NO-OP                  00166  12000 00000
•  00235           LSH  Q*1               00167  05000 00001
•  00236           CL   W(M1)             00170  16030 63500
•  00237           STR  Q*w(AEBOX)        00171  14030 01277  TOTAL TIME
•  00240           ENT  A*w(ZZ1)          00172  11030 01266
•  00241           STR  A*w(AEBOX+1)      00173  15030 01300  ARC
•  00242           ENT  A*w(ZZ2)          00174  11030 01267
•  00243           STR  A*w(AEBOX+2)      00175  15030 01301  NUM LINES
•  00244           ENT  A*w(ZZ3)          00176  11030 01270
•  00245           STR  A*w(AEBOX+3)      00177  15030 01302  SPA LINES
•  00246           ENT  A*w(ZZ4)          00200  11030 01271
•  00247           STR  A*w(AEBOX+4)      00201  15030 01303  TIME LINE
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.   00250           ENT  A*W(ZZ5)              00202   11030 01272
.   00251           STR  A*W(M8)               00203   15030 63507   ROTATE OR NOT
.   00252           RPL  Y+1*W(M1)             00204   36030 63500
.   00253           JP   MCQ3                  00205   61000 00075
.   00254 MC4       CL   W(M7)                 00206   16030 63506
.   00255           RJP  U(IC)                 00207   65020 63426
.   00256           U-TAG    S06*0             00210   01357 00000
.   00257           RJP  U(IC)                 00211   65020 63426
.   00260           U-TAG    S51*I02           00212   01345 01347
.   00261           RJP  U(IC)                 00213   65020 63426
.   00262           U-TAG    S03*I03           00214   01351 01353   ARC LENGTH   (ZZ2)
.   00263           ENT  A*W(TYME)             00215   11030 63141
.   00264           STR  A*W(NULL)             00216   15030 63531
.   00265           ENT  Q*W(ZZ22)             00217   10030 01274
.   00266           LSH  Q*1                   00220   05000 00001
.   00267           MUL  2660266000            00221   22030 02126
.   00270           STR  A*W(ZZ2)              00222   15030 01267
.   00271           CL   W(M4)                 00223   16030 63503
.   00272           ENT  Q*W(ZZ2)             00224   10030 01267
.   00273           ENT  A*W(ZZ1)             00225   11030 01266
.   00274           RJP  FIXZERO               00226   65000 01074
.   00275           RSH  A*1                   00227   02000 00001
.   00276           LSH  A*1                   00230   06000 00001
.   00277           CL   W(M5)                 00231   16030 63504
.   00300           STR  A*W(KRT)              00232   15030 63527
.   00301           STR  Q*W(KRL)              00233   14030 63530
.   00302           STR  Q*W(M5)               00234   14030 63504
.   00303           JP   MCQ3                  00235   61000 00075
.   00304 MC5       CL   W(M7)                 00236   16030 63506
.   00305           RJP  U(IC)                 00237   65020 63426
.   00306           U-TAG    S08*0             00240   01361 00000
.   00307           RJP  U(IC)                 00241   65020 63426
.   00310           U-TAG    S51*I02           00242   01345 01347
.   00311           RJP  U(IC)                 00243   65020 63426
.   00312           U-TAG    S03*I03           00244   01351 01353   ARC LENGTH   (ZZ2)
.   00313           ENT  A*W(TYME)             00245   11030 63141
.   00314           STR  A*W(NULL)             00246   15030 63531
.   00315           ENT  Q*W(ZZ22)             00247   10030 01274
.   00316           LSH  Q*1                   00250   05000 00001
.   00317           MUL  2660266000            00251   22030 02126
.   00320           STR  A*W(ZZ2)              00252   15030 01267
.   00321           CL   W(M4)                 00253   16030 63503
.   00322           ENT  Q*W(ZZ2)             00254   10030 01267
.   00323           ENT  A*W(ZZ1)             00255   11030 01266
.   00324           RJP  FIXZERO               00256   65000 01074
.   00325           RSH  A*1                   00257   02000 00001
.   00326           LSH  A*1                   00260   06000 00001
.   00327           CL   W(M6)                 00261   16030 63505
.   00330           STR  A*W(KDT)              00262   15030 63525
.   00331           STR  Q*W(KDL)              00263   14030 63526
.   00332           STR  Q*W(M6)               00264   14030 63505
.   00333           JP   MCQ3                  00265   61000 00075
.   00334 MC6       RJP  U(IC)                 00266   65020 63426
.   00335           U-TAG    S24*0             00267   01415 00000
.   00336           RJP  U(IC)                 00270   65020 63426
.   00337           U-TAG    S52*I14           00271   01371 01373   LENGTH      221
.   00340           RJP  U(IC)                 00272   65020 63426
.   00341           U-TAG    S15*I15           00273   01375 01377   NUM LINES     ZZ2
.   00342           RJP  U(IC)                 00274   65020 63426
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00343		U-TAG	S16*I16		00275	01401	01403	LINE SPACING	ZZ3
00344		RJP	U(IC)		00276	65020	63426		
00345		U-TAG	S17*I17		00277	01405	01407	TIME/LINE	ZZ4
00346		RJP	U(IC)		00300	65020	63426		
00347		U-TAG	S28*I18		00301	01417	01413	AXIS 0 OR 1	ZZ5
00350		ENT	A*W(TYME)		00302	11030	63141		
00351		STR	A*W(NULL)		00303	15030	63531		
00352		ENT	Q*W(ZZ11)		00304	10030	01273		
00353		MUL	2660266000		00305	22030	02126		
00354		STR	A*W(ZZ1)		00306	15030	01266		
00355		ENT	Q*W(ZZ33)		00307	10030	01275		
00356		MUL	2660266000		00310	22030	02126		
00357		STR	A*W(ZZ3)		00311	15030	01270		
00360		CL	W(M7)		00312	16030	63506		
00361		ENT	A*W(ZZ3)*ANOT		00313	11530	01270		
00362		ENT	A*0000044400		00314	11000	44400	BEAMWIDTH	
00363		STR	A*W(ZZ3)		00315	15030	01270		
00364		ENT	Q*W(ZZ1)		00316	10030	01266		
00365		ENT	A*W(ZZ44)		00317	11030	01276		
00366		RJP	FIXZERO		00320	65000	01074		
00367		STR	A*W(ZZ4)		00321	15030	01271		
00370		ENT	Q*W(ZZ2)		00322	10030	01267		
00371		MUL	W(ZZ4)		00323	22030	01271		
00372		ADD	Q*1		00324	26000	00001		
00373		RSH	Q*1		00325	01000	00001		
00374		NO-OP			00326	12000	00000		
00375		LSH	Q*1		00327	05000	00001		
00376		CL	W(M4)		00330	16030	63503		
00377		STR	Q*W(RDBOX)		00331	14030	01311	TOTAL TIME	
00400		ENT	A*W(ZZ1)		00332	11030	01266		
00401		STR	A*W(RDBOX+1)		00333	15030	01312	ARC	
00402		ENT	A*W(ZZ2)		00334	11030	01267		
00403		STR	A*W(RDBOX+2)		00335	15030	01313	NUM LINES	
00404		ENT	A*W(ZZ3)		00336	11030	01270		
00405		STR	A*W(RDBOX+3)		00337	15030	01314	SPA LINES	
00406		ENT	A*W(ZZ4)		00340	11030	01271		
00407		STR	A*W(RDBOX+4)		00341	15030	01315	TIME LINE	
00410		ENT	A*W(ZZ5)		00342	11030	01272		
00411		STR	A*W(M9)		00343	15030	63510	ROTATE OR NOT	
00412		RPL	Y+1*W(M4)		00344	36030	63503		
00413		JP	MCQ3		00345	61000	00075		
00414	MC7	RJP	U(IC)		00346	65020	63426		
00415		U-TAG	S10*0		00347	01363	00000		
00416		RJP	U(IC)		00350	65020	63426		
00417		U-TAG	S51*I02		00351	01345	01347		
00420		RJP	U(IC)		00352	65020	63426		
00421		U-TAG	S03*I03		00353	01351	01353	ARC LENGTH (ZZ2)	
00422		ENT	A*W(TYME)		00354	11030	63141		
00423		STR	A*W(NULLY)		00355	15030	63532		
00424		ENT	Q*W(ZZ22)		00356	10030	01274		
00425		LSH	Q*1		00357	05000	00001		
00426		MUL	2660266000		00360	22030	02126		
00427		STR	A*W(ZZ2)		00361	15030	01267		
00430		CL	W(M1)		00362	16030	63500		
00431		ENT	Q*W(ZZ2)		00363	10030	01267		
00432		ENT	A*W(ZZ1)		00364	11030	01266		
00433		RJP	FIXZERO		00365	65000	01074		
00434		RSH	A*1		00366	02000	00001		
00435		LSH	A*1		00367	06000	00001		

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.    00436        CL   W(M2)                    00370  16030 63501
.    00437        STR  A*W(KAT)                 00371  15030 63523
.    00440        STR  Q*W(KAL)                 00372  14030 63524
.    00441        STR  Q*W(M2)                  00373  14030 63501
.    00442        STR  Q*W(M7)                  00374  14030 63506
.    00443        JP   MCQ3                     00375  61000 00075
.    00444 MC8    RJP  U(IC)                    00376  65020 63426
.    00445        U-TAG    S12*0                00377  01365 00000
.    00446        RJP  U(IC)                    00400  65020 63426
.    00447        U-TAG    S51*I02              00401  01345 01347
.    00450        RJP  U(IC)                    00402  65020 63426
.    00451        U-TAG    S03*I03              00403  01351 01353  ARC LENGTH  (ZZ2)
.    00452        ENT  A*W(TYME)               00404  11030 63141
.    00453        STR  A*W(NULLY)              00405  15030 63532
.    00454        ENT  Q*W(ZZ22)               00406  10030 01274
.    00455        LSH  Q*1                      00407  05000 00001
.    00456        MUL  2660266000              00410  22030 02126
.    00457        STR  A*W(ZZ2)                 00411  15030 01267
.    00460        CL   W(M1)                    00412  16030 63500
.    00461        ENT  Q*W(ZZ2)                 00413  10030 01267
.    00462        ENT  A*W(ZZ1)                 00414  11030 01266
.    00463        RJP  FIXZERO                  00415  65000 01074
.    00464        RSH  A*1                      00416  02000 00001
.    00465        LSH  A*1                      00417  06000 00001
.    00466        CL   W(M3)                    00420  16030 63502
.    00467        STR  A*W(KET)                 00421  15030 63521
.    00470        STR  Q*W(KEL)                 00422  14030 63522
.    00471        STR  Q*W(M3)                  00423  14030 63502
.    00472        STR  Q*W(M7)                  00424  14030 63506
.    00473        JP   MCQ3                     00425  61000 00075
.    00474 MC9    RJP  U(IC)                    00426  65020 63426
.    00475        U-TAG    S34*0                00427  01421 00000
.    00476        RJP  U(IC)                    00430  65020 63426
.    00477        U-TAG    S52*I14              00431  01371 01373  LENGTH    221
.    00500        RJP  U(IC)                    00432  65020 63426
.    00501        U-TAG    S15*I15              00433  01375 01377  NUM LINES      ZZ2
.    00502        RJP  U(IC)                    00434  65020 63426
.    00503        U-TAG    S16*I16              00435  01401 01403  LINE SPACING   ZZ3
.    00504        RJP  U(IC)                    00436  65020 63426
.    00505        U-TAG    S17*I17              00437  01405 01407  TIME/LINE      ZZ4
.    00506        RJP  U(IC)                    00440  65020 63426
.    00507        U-TAG    S38*I18              00441  01423 01413  AXIS 0 OR 1    ZZ5
.    00510        ENT  A*W(TYME)               00442  11030 63141
.    00511        STR  A*W(NULLY)              00443  15030 63532
.    00512        ENT  Q*W(ZZ11)               00444  10030 01273
.    00513        MUL  2660266000              00445  22030 02126
.    00514        STR  A*W(ZZ1)                 00446  15030 01266
.    00515        ENT  Q*W(ZZ33)               00447  10030 01275
.    00516        MUL  2660266000              00450  22030 02126
.    00517        STR  A*W(ZZ3)                 00451  15030 01270
.    00520        ENT  A*W(ZZ3)*ANOT           00452  11530 01270
.    00521        ENT  A*44400                  00453  11000 44400  BEAMWIDTH
.    00522        STR  A*W(ZZ3)                 00454  15030 01270
.    00523        ENT  Q*W(ZZ1)                 00455  10030 01266
.    00524        ENT  A*W(ZZ44)                00456  11030 01276
.    00525        RJP  FIXZERO                  00457  65000 01074
.    00526        STR  A*W(ZZ4)                 00460  15030 01271
.    00527        ENT  Q*W(ZZ2)                 00461  10030 01267
.    00530        MUL  W(ZZ4)                   00462  22030 01271
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.   00531            ADD   Q*1                          00463  26000  00001
.   00532            RSH   Q*1                          00464  01000  00001
.   00533            NO-OP                              00465  12000  00000
.   00534            LSH   Q*1                          00466  05000  00001
.   00535            CL    W(M1)                        00467  16030  63500
.   00536            STR   Q*W(AEBOX)                   00470  14030  01277   TOTAL TIME
.   00537            ENT   A*W(ZZ1)                     00471  11030  01266
.   00540            STR   A*W(AEBOX+1)                 00472  15030  01300   ARC
.   00541            ENT   A*W(ZZ2)                     00473  11030  01267
.   00542            STR   A*W(AEBOX+2)                 00474  15030  01301   NUM LINES
.   00543            ENT   A*W(ZZ3)                     00475  11030  01270
.   00544            STR   A*W(AEBOX+3)                 00476  15030  01302   SPA LINES
.   00545            ENT   A*W(ZZ4)                     00477  11030  01271
.   00546            STR   A*W(AEBOX+4)                 00500  15030  01303   TIME LINE
.   00547            ENT   A*W(ZZ5)                     00501  11030  01272
.   00550            STR   A*W(M8)                      00502  15030  63507
.   00551            RPL   Y+1*W(M1)                    00503  36030  63500
.   00552            RPL   Y+1*W(M7)                    00504  36030  63506
.   00553            JP    MCQ3                         00505  61000  00075
.   00554 MC10       ENT   A*W(TYME)                    00506  11030  63141
.   00555            SUB   A*7                          00507  21000  00007
.   00556            STR   A*W(TOME)                    00510  15030  63520
.   00557            CL    CPW(M10)                     00511  16070  63511
.   00560            RJP   U(IC)                        00512  65020  63426
.   00561            U-TAG     FR12*I01                 00513  02023  01337
.   00562            JP    MCQQ                         00514  61000  00014
.   00563 MC13       CL    W(M10)                       00515  16030  63511
.   00564            ENT   Q*W(TYME)                    00516  11030  63141
.   00565            SUB   Q*W(TOME                     00517  27030  63520
.   00566            RPL   Y+Q*W(NULL)                  00520  34030  63531
.   00567            RPL   Y+Q*W(NULLY)                 00521  34030  63532
.   00570            RJP   U(IC)                        00522  65020  63426
.   00571            U-TAG     FR13*I01                 00523  02025  01337
.   00572            JP    MCQQ                         00524  61000  00014
.   00573 MC14       RJP   U(IC)                        00525  65020  63426
.   00574            U-TAG     AZZY1*I03                00526  01705  01353
.   00575            ENT   Q*W(ZZ22)                    00527  11030  01274
.   00576            MUL   2660266000                   00530  22030  02126
.   00577            STR   A*W(KKAL)                    00531  15030  63512
.   00600            JP    MCXX                         00532  61000  00574
.   00601 MC15       RJP   U(IC)                        00533  65020  63426
.   00602            U-TAG     AZZY4*I03                00534  01707  01353
.   00603            ENT   Q*W(ZZ22)                    00535  10030  01274
.   00604            MUL   2660266000                   00536  22030  02126
.   00605            STR   A*W(KKEL)                    00537  15030  63513
.   00606            JP    MCXX                         00540  61000  00574
.   00607 MC16       RJP   U(IC)                        00541  65020  63426
.   00610            U-TAG     AZZY5*I03                00542  01711  01353
.   00611            ENT   Q*W(ZZ22)                    00543  10030  01274
.   00612            MUL   2660266000                   00544  22030  02126
.   00613            STR   A*W(KKRL)                    00545  15030  63514
.   00614            BSK   B0*W(DRIFTFLAG)              00546  71030  02121
.   00615            JP    MC17                         00547  61000  00551
.   00616            JP    MCXX                         00550  61000  00574
.   00617 MC17       RJP   U(IC)                        00551  65020  63426
.   00620            U-TAG     AZZY6*I03                00552  01713  01353
.   00621            ENT   Q*W(ZZ22)                    00553  10030  01274
.   00622            MUL   2660266000                   00554  22030  02126
.   00623            STR   A*W(KKDL)                    00555  15030  63515
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·   00624          BSK   B0*W(DRIFTFLAG)           00556   71030 02121
·   00625          JP    MC20A                     00557   61000 00602
·   00626          JP    MCXX                      00560   61000 00574
·   00627 MC18     RJP   U(IC)                     00561   65020 63426
·   00630          U-TAG       AZZY7*I03           00562   01715 01353
·   00631          ENT   Q*W(ZZ22)                 00563   10030 01274
·   00632          MUL   2660266000                00564   22030 02126
·   00633          STR   A*W(KKCL)                 00565   15030 63516
·   00634          JP    MCXX                      00566   61000 00574
·   00635 MC19     RJP   U(IC)                     00567   65020 63426
·   00636          U-TAG       AZZY8*I03           00570   01717 01353
·   00637          ENT   Q*W(ZZ22)                 00571   10030 01274
·   00640          MUL   2660266000                00572   22030 02126
·   00641          STR   A*W(KKLL)                 00573   15030 63517
·   00642 MCXX     RJP   U(IC)                     00574   65020 63426
·   00643          U-TAG       FR15*I01            00575   02031 01337
·   00644          JP    MCQQ                      00576   61000 00014
·   00645 MC20     CL    CPL(DRIFTFLAG)            00577   16050 02121
·   00646          CL    W(M11)                    00600   16030 02124
·   00647          JP    MC16                      00601   61000 00541
·   00650 MC20A    CL    W(DRIFTFLAG)              00602   16030 02121
·   00651          RJP   U(IC)                     00603   65020 63426
·   00652          U-TAG       PCOUT1*PCIN1        00604   02103 02115
·   00653          SIL                             00605   64000 00000
·   00654          PUT   W(AZ1)*W(DRFTAZ)          00606   10030 63053
                                                   00607   14030 02122
·   00655          PUT   W(EL1)*W(DRFTEL)          00610   10030 63054
                                                   00611   14030 02123
·   00656          CL    CPL(M11)                  00612   16050 02124
·   00657          RIL                             00613   60000 00000
·   00660 MCPC     RJP   U(IC)                     00614   65020 63426
·   00661          U-TAG       FR26*I01            00615   02074 01337
·   00662          JP    MCQQ                      00616   61000 00014
·   00663 SCAN2Q   BSK   B0*W(M11)                 00617   71030 02124
·   00664          ENT   A*W(DRFTAZ)*SKIP          00620   11130 02122
·   00665          ENT   A*W(AZ1)                  00621   11030 63053
·   00666          ADD   A*W(KKAL)                 00622   20030 63512
·   00667          STR   A*W(AZ2)                  00623   15030 63055
·   00670          BSK   B0*W(M11)                 00624   71030 02124
·   00671          ENT   A*W(DRFTEL)*SKIP          00625   11130 02123
·   00672          ENT   A*W(EL1)                  00626   11030 63054
·   00673          ADD   A*W(KKEL)                 00627   20030 63513
·   00674          STR   A*W(EL2)                  00630   15030 63056
·   00675          ENT   Q*W(KKCL)                 00631   10030 63516
,   00676          MUL   W(ANS)                    00632   22030 63066
·   00677          LSH   AQ*1                      00633   07000 00001
·   00700          RPL   A+Y*W(EL2)                00634   24030 63056
·   00701          ENT   Q*W(KKLL)                 00635   10030 63517
·   00702          MUL   W(ANC)                    00636   22030 63070
·   00703          LSH   AQ*1                      00637   07000 00001
·   00704          RPL   A+Y*W(EL2)                00640   24030 63056
·   00705          ENT   Q*W(KKCL)                 00641   10030 63516
·   00706          MUL   W(ANC)                    00642   22030 63070
·   00707          LSH   AQ*1                      00643   07000 00001
·   00710          RPL   A+Y*W(AZ2)                00644   24030 63055
·   00711          ENT   Q*W(KKLL)                 00645   10030 63517
·   00712          MUL   W(ANS)                    00646   22030 63066
·   00713          RSH   AQ*29D                    00647   03000 00035
·   00714          RPL   Y-Q*W(AZ2)                00650   35030 63055
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 .    00715          CL    W(FFF)                         00651  16030  02117
 .    00716          CL    W(FFFF)                        00652  16030  02120
 .    00717          ENT   Q*W(TYME)                      00653  10030  63141
 .    00720          ENT   A*W(M10)*AZERO                 00654  11430  63511
 .    00721          ENT   Q*W(TOME)                      00655  10030  63520
 .    00722          SUB   Q*W(NULLY)                     00656  27030  63532
 .    00723          STR   Q*W(TT)                        00657  14030  00002
 .    00724          ENT   A*W(M1)*ANOT                   00660  11530  63500
 .    00725          JP    P5                             00661  61000  00700   (ROX SCAN)
 .    00726          MOVE  6*AEBOX*BOX                    00662  12700  00005
                                                          00663  10037  01277
                                                          00664  14037  01323
                                                          00665  72700  00663
 .    00727          RJP   DOBOX                          00666  65000  01144
 .    00730          ENT   Q*W(BOXOUT1)                   00667  10030  01335
 .    00731          ENT   A*W(M8)*AZERO                  00670  11430  63507
 .    00732          STR   Q*W(FFFF)*SKIP                 00671  14130  02120
 .    00733          STR   Q*W(FFF)                       00672  14030  02117
 .    00734          ENT   A*W(M8)                        00673  11030  63507
 .    00735          ENT   Q*W(BOXOUT2)*AZERO             00674  10430  01336
 .    00736          STR   Q*W(FFF)*SKIP                  00675  14130  02117
 .    00737          STR   Q*W(FFFF)                      00676  14030  02120
 .    00740          JP    P2                             00677  61000  00714
 .    00741 P5       ENT   A*W(M2)*ANOT                   00700  11530  63501
 .    00742          JP    P7                             00701  61000  00706
 .    00743          ENT   A*W(KAT)                       00702  11030  63523
 .    00744          ENT   Q*W(KAL)                       00703  10030  63524
 .    00745          RJP   BKANDFORTH                     00704  65000  01044
 .    00746          STR   Q*W(FFF)                       00705  14030  02117
 .    00747 P7       ENT   A*W(M3)*ANOT                   00706  11530  63502
 .    00750          JP    P2                             00707  61000  00714
 .    00751          ENT   A*W(KET)                       00710  11030  63521
 .    00752          ENT   Q*W(KEL)                       00711  10030  63522
 .    00753          RJP   BKANDFORTH                     00712  65000  01044
 .    00754          STR   Q*W(FFFF)                      00713  14030  02120
 .    00755 P2       ENT   A*W(M7)*ANOT                   00714  11530  63506
 .    00756          JP    PPUT                           00715  61000  00743
 .    00757          ENT   Q*W(FFF)                       00716  10030  02117
 .    00760          MUL   W(ANS)                         00717  22030  63066
 .    00761          LSH   AQ*1                           00720  07000  00001
 .    00762          STR   A*W(TEMP)                      00721  15030  01031
 .    00763          ENT   Q*W(FFFF)                      00722  10030  02120
 .    00764          MUL   W(ANC)                         00723  22030  63070
 .    00765          LSH   AQ*1                           00724  07000  00001
 .    00766          ADD   A*W(TEMP)                      00725  20030  01031
 .    00767          STR   A*W(TEMP1)                     00726  15030  01032
 .    00770          ENT   Q*W(FFFF)                      00727  10030  02120
 .    00771          MUL   W(ANS)                         00730  22030  63066
 .    00772          LSH   AQ*1                           00731  07000  00001
 .    00773          STR   A*W(TEMP)                      00732  15030  01031
 .    00774          ENT   Q*W(FFF)                       00733  10030  02117
 .    00775          MUL   W(ANC)                         00734  22030  63070
 .    00776          LSH   AQ*1                           00735  07000  00001
 .    00777          SUB   A*W(TEMP)                      00736  21030  01031
 .    01000          RPL   A+Y*W(AZ2)                     00737  24030  63055
 .    01001          ENT   A*W(TEMP1)                     00740  11030  01032
 .    01002          RPL   A+Y*W(EL2)                     00741  24030  63056
 .    01003          JP    P6                             00742  61000  00747
 .    01004 PPUT     ENT   A*W(FFF)                       00743  11030  02117
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•	01005	RPL	A+Y*W(AZ2)
•	01006	ENT	A*W(FFFF)
•	01007	RPL	A+Y*W(EL2)
•	01010 P6	ENT	A*W(EL2)
•	01011	SUB	A*0200000000*ANEG
•	01012	CL	A
•	01013	ADD	A*0202660266*APOS
•	01014	CL	A
•	01015	SUB	A*0002660266
•	01016	STR	A*W(EL2)
•	01017 SCAN2	JP	0
•	01020	JP	SCAN2Q
•	01021 SCAN1	JP	0
•	01022	ENT	A*W(RA1)
•	01023	ADD	A*W(KKRL)
•	01024	STR	A*W(RA2)
•	01025	ENT	A*W(DN1)
•	01026	ADD	A*W(KKDL)
•	01027	STR	A*W(DN2)
•	01030	ENT	Q*W(TYME)
•	01031	ENT	A*W(M10)*AZERO
•	01032	ENT	Q*W(TOME)
•	01033	SUB	Q*W(NULL)
•	01034	STR	Q*W(TT)
•	01035	ENT	A*W(M4)*ANOT
•	01036	JP	P4
•	01037	MOVE	6*RDBOX*BOX
•	01040	RJP	DOBOX
•	01041	ENT	Q*W(BOXOUT1)
•	01042	ENT	A*W(M9)*AZERO
•	01043	RPL	Y+Q*W(DN2)*SKIP
•	01044	RPL	Y+Q*W(RA2)
•	01045	ENT	A*W(M9)
•	01046	ENT	Q*W(BOXOUT2)*AZERO
•	01047	RPL	Y+Q*W(RA2)*SKIP
•	01050	RPL	Y+Q*W(DN2)
•	01051	JP	SCAN1
•	01052 P4	ENT	A*W(M5)*ANOT
•	01053	JP	P3
•	01054	ENT	A*W(KRT)
•	01055	ENT	Q*W(KRL)
•	01056	RJP	BKANDFORTH
•	01057	RPL	Y+Q*W(RA2)
•	01060 P3	ENT	A*W(M6)*ANOT
•	01061	JP	SCAN1
•	01062	ENT	A*W(KDT)
•	01063	ENT	Q*W(KDL)
•	01064	RJP	BKANDFORTH
•	01065	RPL	Y+Q*W(DN2)
•	01066	JP	SCAN1
•	01067 TEMP	0	0
•	01070 TEMP1	0	0
•	01071 T	0	
•	01072 T0	0	
•	01073 T1	0	
•	01074 T2	0	

00744	24030 63055	
00745	11030 02120	
00746	24030 63056	
00747	11030 63056	
00750	21730 02127	
00751	11000 00000	
00752	20630 02130	
00753	11000 00000	
00754	21030 02131	
00755	15030 63056	
00756	61000 00000	
00757	61000 00617	
00760	61000 00000	LAT LONG ENTRY
00761	11030 63002	
00762	20030 63514	
00763	15030 63004	
00764	11030 63003	
00765	20030 63515	
00766	15030 63005	
00767	10030 63141	
00770	11430 63511	
00771	10030 63520	
00772	27030 63531	
00773	14030 00002	
00774	11530 63503	
00775	61000 01014	(BOX SCAN)
00776	12700 00005	
00777	10037 01311	
01000	14037 01323	
01001	72700 00777	
01002	65000 01144	
01003	10030 01335	
01004	11430 63510	
01005	34130 63005	
01006	34030 63004	
01007	11030 63510	
01010	10430 01336	
01011	34130 63004	
01012	34030 63005	
01013	61000 00760	
01014	11530 63504	
01015	61000 01022	(ASC SCAN)
01016	11030 63527	
01017	10030 63530	
01020	65000 01044	
01021	34030 63004	
01022	11530 63505	
01023	61000 00760	
01024	11030 63525	
01025	10030 63526	
01026	65000 01044	
01027	34030 63005	
01030	61000 00760	
01031	00000 00000	
01032	00000 00000	
01033	00000 00000	
01034	00000 00000	
01035	00000 00000	
01036	00000 00000	

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·    01075 T3              0                           01037  00000 00000
·    01076 T4              0        0                  01040  00000 00000
·    01077 T5              0        0                  01041  00000 00000
·    01100 T6              0        0                  01042  00000 00000
·    01101 L               0                           01043  00000 00000
·    01102 BKANDFORTH      JP       0                  01044  61000 00000
·    01103                 STR      Q*W(L)             01045  14030 01043
·    01104                 RSH      Q*1                01046  01000 00001
·    01105                 STR      Q*W(T3)            01047  14030 01037
·    01106                 STR      A*W(T2)            01050  15030 01036
·    01107                 RSH      A*1                01051  02000 00001
·    01110                 STR      A*W(T0)            01052  15030 01034
·    01111                 ENT      A*W(TT)            01053  11030 00002
·    01112                 RSH      AQ*30D             01054  03000 00036
·    01113                 DIV      W(T2)              01055  23030 01036
·    01114                 SUB      A*W(T0)*APOS       01056  21630 01034
·    01115                 JP       P10                01057  61000 01066
·    01116                 STR      A*W(T)             01060  15030 01033
·    01117                 RJP      LINE               01061  65000 01212
·    01120                 SUB      A*W(T3)            01062  21030 01037
·    01121                 CP       A                  01063  15040 00000
·    01122                 ENT      Q*A                01064  10070 00000
·    01123                 JP       BKANDFORTH         01065  61000 01044
·    01124 P10             ADD      A*W(T0)            01066  20030 01034
·    01125                 STR      A*W(T)             01067  15030 01033
·    01126                 RJP      LINE               01070  65000 01212
·    01127                 SUB      A*W(T3)            01071  21030 01037
·    01130                 ENT      Q*A                01072  10070 00000
·    01131                 JP       BKANDFORTH         01073  61000 01044
·    01132 FIXZERO         JP       0                  01074  61000 00000
·    01133                 STR      A*W(PYRD)          01075  15030 01132
·    01134                 STR      Q*W(AYRD)          01076  14030 01131
·    01135                 ENT      A*2                01077  11000 00002
·    01136                 SUB      Q*0001330133*QPOS  01100  27630 02132
·    01137                 JP       KYRD               01101  61000 01116
·    01140                 ADD      A*2                01102  20000 00002
·    01141                 SUB      Q*0004210421*QPOS  01103  27630 02133
·    01142                 JP       KYRD               01104  61000 01116
·    01143                 ADD      A*2                01105  20000 00002
·    01144                 SUB      Q*0007070707*QPOS  01106  27630 02134
·    01145                 JP       KYRD               01107  61000 01116
·    01146                 MUL      2525252525         01110  22030 02135
·    01147                 LSH      A*1                01111  06000 00001
·    01150                 ADD      A*0021042104       01112  20030 02136
·    01151                 RSH      AQ*30D             01113  03000 00036
·    01152                 DIV      0001330133         01114  23030 02132
·    01153                 STR      Q*A                01115  14040 00000   P=2/3L+12
·    01154 KYRD            COM      A*W(PYRD)*YLESS    01116  04630 01132
·    01155                 JP       FYRD               01117  61000 01126
·    01156                 SUB      A*W(PYRD)*ANOT     01120  21530 01132
·    01157                 JP       FYRD               01121  61000 01126
·    01160                 ADD      A*W(PYRD)          01122  20030 01132
·    01161                 STR      A*W(PYRD)          01123  15030 01132
·    01162                 RJP      U(IC)              01124  65020 63426
·    01163                 U-TAG        TYRD*0         01125  01133 00000
·    01164 FYRD            ENT      A*W(PYRD)          01126  11030 01132
·    01165                 ENT      Q*W(AYRD)          01127  10030 01131
·    01166                 JP       FIXZERO            01130  61000 01074
·    01167 AYRD            0        0                  01131  00000 00000
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·    01170 PYRD      0     0                          01132  00000 00000
·    01171 TYRD      FD    1*A                        01133  06050 50505
·    01172           0     LYRD                       01134  00000 01137
·    01173           FD    1*D                        01135  11050 50505
·    01174           -0    PYRD                       01136  77777 01132
·    01175 LYRD      FD    0*PERIOD ADJUSTED TO       01137  25122 71624
                                                      01140  11050 61117
                                                      01141  32303 11211
                                                      01142  05312 40000
·    01176           -0    -0                         01143  77777 77777
·    01177 DOBOX     JP    0                          01144  61000 00000
·    01200           ENT   A*w(TT)                    01145  11030 00002
·    01201           RSH   AQ*30D                     01146  03000 00036
·    01202           DIV   w(BOX)                     01147  23030 01323
·    01203           CL    Q                          01150  10000 00000
·    01204           STR   A*w(TT)                    01151  15030 00002
·    01205           SUB   A*w(BOX+4)*ANEG            01152  21730 01327
·    01206           ADD   Q*1*SKIP                   01153  26100 00001
·    01207           ADD   A*w(BOX+4)*SKIP            01154  20130 01327
·    01210           JP    s-3                        01155  61000 01152
·    01211           STR   Q*w(T4)                    01156  14030 01040
·    01212           SUB   Q*w(BOX+2)*QNEG            01157  27730 01325  Q HAS NUM LINES-1 A HAS REM. T
                                                                          IME
·    01213           JP    DOBOX1                     01160  61000 01200
·    01214           ENT   A*w(BOX+4)                 01161  11030 01327
·    01215           LSH   A*1                        01162  06000 00001
·    01216           ENT   Q*w(BOX+1)                 01163  10030 01324
·    01217           RJP   BKANDFORTH                 01164  65000 01044
·    01220           STR   Q*w(BOXOUT1)               01165  14030 01335
·    01221           ENT   Q*w(BOX+2)                 01166  10030 01325
·    01222           SUB   Q*1                        01167  27000 00001
·    01223           MUL   w(BOX+3)                   01170  22030 01326
·    01224           RSH   Q*1                        01171  01000 00001
·    01225           STR   Q*w(T5)                    01172  14030 01041
·    01226           ENT   Q*w(T4)                    01173  10030 01040
·    01227           MUL   w(BOX+3)                   01174  22030 01326
·    01230           SUB   Q*w(T5)                    01175  27030 01041
·    01231           STR   Q*w(BOXOUT2)               01176  14030 01336
·    01232           JP    DOBOX                      01177  61000 01144
·    01233 DOBOX1    ENT   A*w(BOX+1)                 01200  11030 01324
·    01234           RSH   A*1                        01201  02000 00001
·    01235           CP    A                          01202  15040 00000
·    01236           STR   A*w(BOXOUT1)               01203  15030 01335
·    01237           ENT   Q*w(BOX+2)                 01204  10030 01325
·    01240           SUB   Q*1                        01205  27000 00001
·    01241           MUL   w(BOX+3)                   01206  22030 01326
·    01242           CP    A                          01207  15040 00000
·    01243           STR   A*w(BOXOUT2)               01210  15030 01336
·    01244           JP    DOBOX                      01211  61000 01144
·    01245 LINE      JP    0                          01212  61000 00000
·    01246           ENT   A*w(T0)                    01213  11030 01034
·    01247           RSH   A*1                        01214  02000 00001
·    01250           SUB   A*w(T)*APOS                01215  21630 01033
·    01251           JP    LINE1                      01216  61000 01221
·    01252           RJP   LINEX                      01217  65000 01230
·    01253           JP    LINE                       01220  61000 01212
·    01254 LINE1     ENT   A*w(T0)                    01221  11030 01034
·    01255           SUB   A*w(T)                     01222  21030 01033
·    01256           STR   A*w(T)                     01223  15030 01033
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·   01257          RJP   LINEX              01224   65000 01230
·   01260          CP    A                  01225   15040 00000
·   01261          ADD   A*W(L)             01226   20030 01043
·   01262          JP    LINE               01227   61000 01212
·   01263 LINEX    JP    0                  01230   61000 00000
·   01264          ENT   Q*W(T0)            01231   10030 01034
·   01265          SUB   Q*6*QPOS           01232   27600 00006
·   01266          JP    LINE2              01233   61000 01243
·   01267          ADD   Q*3                01234   26000 00003
·   01270          MUL   6                  01235   22000 00006
·   01271          STR   Q*W(T6)            01236   14030 01042
·   01272          ENT   A*W(L)             01237   11030 01043
·   01273          RSH   AQ*30D             01240   03000 00036
·   01274          DIV   W(T6)              01241   23030 01042
·   01275          JP    LINE3              01242   61000 01250
·   01276 LINE2    ENT   Q*W(L)             01243   10030 01043
·   01277          MUL   2                  01244   22000 00002
·   01300          DIV   W(T0)              01245   23030 01034
·   01301          CL    A                  01246   11000 00000
·   01302          DIV   W(T0)              01247   23030 01034
·   01303 LINE3    STR   Q*W(S)             01250   14030 01265
·   01304          ENT   Q*W(T)             01251   10030 01033
·   01305          MUL   W(T)               01252   22030 01033
·   01306          SUB   Q*5*QNEG           01253   27700 00005
·   01307          ENT   Q*W(T)*SKIP        01254   10130 01033
·   01310          ADD   Q*14D*SKIP         01255   26100 00016
·   01311          MUL   6                  01256   22000 00006
·   01312          SUB   Q*9D               01257   27000 00011
·   01313 LINE4    MUL   W(S)               01260   22030 01265
·   01314          STR   Q*A                01261   14040 00000
·   01315          JP    LINEX              01262   61000 01230
·   01316 KIND     0     0                  01263   00000 00000
·   01317 ENDTIM   0     0                  01264   00000 00000
·   01320 S        0     0                  01265   00000 00000
·   01321 ZZ1      0     0                  01266   00000 00000
·   01322 ZZ2      0     0                  01267   00000 00000
·   01323 ZZ3      0     0                  01270   00000 00000
·   01324 ZZ4     U     0                  01271   00000 00000
·   01325 ZZ5      0     0                  01272   00000 00000
·   01326 ZZ11     0                        01273   00000 00000
·   01327 ZZ22     0                        01274   00000 00000
·   01330 ZZ33     0                        01275   00000 00000
·   01331 ZZ44     0                        01276   00000 00000
·   01332 AEBOX    RESERVE    10D           01277   00000 00000
·   01333 RDBOX    RESERVE    10D           01311   00000 00000
·   01334 BOX      RESERVE    10D           01323   00000 00000
·   01335 BOXOUT1  0     0                  01335   00000 00000
·   01336 BOXOUT2  0     0                  01336   00000 00000
·   01337 I01      FD    1*D                01337   11050 50505
·   01340           10    KIND              01340   00010 01263
·   01341           0     0                 01341   00000 00000
·   01342           0     18D               01342   00000 00022
·   01343 S02      FD    1*A                01343   06050 50505
·   01344          -0    A03                01344   77777 01451
·   01345 S51      FD    1*A                01345   06050 50505
·   01346          77777       A04          01346   77777 01454
·   01347 I02      FD    1*D                01347   11050 50505
·   01350 S        0     ZZ1                01350   00000 01266
·   01351 S03      FD    1*A                01351   06050 50505
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·   01352              77777    A05              01352   77777 01460
·   01353 I03          FD   1*X20               01353   35622 40505
·   01354              0    ZZ22                 01354   00000 01274
·   01355 S04          FD   1*A                  01355   06050 50505
·   01356              -0   A06                  01356   77777 01465
·   01357 S06          FD   1*A                  01357   06050 50505
·   01360              -0   A07                  01360   77777 01470
·   01361 S08          FD   1*A                  01361   06050 50505
·   01362              -0   A08                  01362   77777 01473
·   01363 S10          FD   1*A                  01363   06050 50505
·   01364              -0   A09                  01364   77777 01476
·   01365 S12          FD   1*A                  01365   06050 50505
·   01366              -0   A10                  01366   77777 01502
·   01367 S14          FD   1*A                  01367   06050 50505
·   01370              -0   A11                  01370   77777 01506
·   01371 S52          FD   1*A                  01371   06050 50505
·   01372              77777    FR1              01372   77777 01721
·   01373 I14          FD   1*X20               01373   35622 40505
·   01374              0    ZZ11                 01374   00000 01273
·   01375 S15          FD   1*A                  01375   06050 50505
·   01376              77777    A12              01376   77777 01512
·   01377 I15          FD   1*D                  01377   11050 50505
·   01400              0    ZZ2                  01400   00000 01267
·   01401 S16          FD   1*A                  01401   06050 50505
·   01402              77777    A13              01402   77777 01516
·   01403 I16          FD   1*X20               01403   35622 40505
·   01404              0    ZZ33                 01404   00000 01275
·   01405 S17          FD   1*A                  01405   06050 50505
·   01406              77777    A14              01406   77777 01522
·   01407 I17          FD   1*D                  01407   11050 50505
·   01410              0    ZZ44                 01410   00000 01276
·   01411 S18          FD   1*A                  01411   06050 50505
·   01412              77777    A15              01412   77777 01526
·   01413 I18          FD   1*D                  01413   11050 50505
·   01414              0    ZZ5                  01414   00000 01272
·   01415 S24          FD   1*A                  01415   06050 50505
·   01416              -0   A16                  01416   77777 01535
·   01417 S28          FD   1*A                  01417   06050 50505
·   01420              77777    A17              01420   77777 01541
·   01421 S34          FD   1*A                  01421   06050 50505
·   01422              -0   A18                  01422   77777 01550
·   01423 S38          FD   1*A                  01423   06050 50505
·   01424              77777    A19              01424   77777 01554
·   01425 S40          FD   1*A                  01425   06050 50505
·   01426              77777    A20              01426   77777 01566
·   01427 S41          FD   1*A                  01427   06050 50505
·   01430              77777    A21              01430   77777 01572
·   01431 S42          FD   1*A                  01431   06050 50505
·   01432              77777    A22              01432   77777 01575
·   01433 S43          FD   1*A                  01433   06050 50505
·   01434              77777    A23              01434   77777 01602
·   01435 S44          FD   1*A                  01435   06050 50505
·   01436              77777    A24              01436   77777 01610
·   01437 S61          FD   1*A                  01437   06050 50505
·   01440              -0   A20                  01440   77777 01566
·   01441 S62          FD   1*A                  01441   06050 50505
·   01442              -0   A21                  01442   77777 01572
·   01443 S63          FD   1*A                  01443   06050 50505
·   01444              -0   A22                  01444   77777 01575
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.   01445 S64        FD   1*A                          01445  06050 50505
.   01446            -0   A23                          01446  77777 01602
.   01447 S65        FD   1*A                          01447  06050 50505
.   01450            -0   A24                          01450  77777 01610
.   01451 A03        FD   0*AZ SCAN                    01451  06370 53010
                                                       01452  06230 00000
.   01452            77777     77777                   01453  77777 77777
.   01453 A04        FD   0*PERIOD IN SEC =            01454  25122 71624
                                                       01455  11051 62305
                                                       01456  30121 00544
.   01454            77777     77777                   01457  77777 77777
.   01455 A05        FD   0*HALF-ARC IN DEGREES        01460  15062 11341
                                                       01461  06271 00516
                                                       01462  23051 11214
                                                       01463  27121 23000
.   01456            77777     77777                   01464  77777 77777
.   01457 A06        FD   0*EL SCAN                    01465  12210 53010
                                                       01466  06230 00000
.   01460            77777     77777                   01467  77777 77777
.   01461 A07        FD   0*RA SCAN                    01470  27060 53010
                                                       01471  06230 00000
.   01462            77777     77777                   01472  77777 77777
.   01463 A08        FD   0*DEC SCAN                   01473  11121 00530
                                                       01474  10062 30000
.   01464            77777     77777                   01475  77777 77777
.   01465 A09        FD   0*ACROSS SCAN                01476  06102 72430
                                                       01477  30053 01006
                                                       01500  23000 00000
.   01466            77777     77777                   01501  77777 77777
.   01467 A10        FD   0*ALONG  SCAN                01502  06212 42314
                                                       01503  05053 01006
                                                       01504  23000 00000
.   01470            77777     77777                   01505  77777 77777
.   01471 A11        FD   0*AE BOX SCAN                01506  06120 50724
                                                       01507  35053 01006
                                                       01510  23000 00000
.   01472            77777     77777                   01511  77777 77777
.   01473 A12        FD   0*LINES PER BOX =            01512  21162 31230
                                                       01513  05251 22705
                                                       01514  07243 50544
.   01474            77777     77777                   01515  77777 77777
.   01475 A13        FD   0*SPACING IN DEG=            01516  30250 61016
                                                       01517  23140 51623
                                                       01520  05111 21444
.   01476            77777     77777                   01521  77777 77777
.   01477 A14        FD   0*TIME/LINE(SEC)=            01522  31162 21274
                                                       01523  21162 31251
                                                       01524  30121 04044
.   01500            77777     77777                   01525  77777 77777
.   01501 A15        FD   0*LINES PARALLEL TO AZ(0),EL(1)  01526  21162 31230
                                                       01527  05250 62706
                                                       01530  21211 22105
                                                       01531  31240 50637
                                                       01532  51244 05612
                                                       01533  21516 14000
.   01502            77777     77777                   01534  77777 77777
.   01503 A16        FD   0*RA-DEC BOX SCAN            01535  27064 11112
                                                       01536  10050 72435
                                                       01537  05301 00623
```

.	01504		77777 77777	01540	77777 77777
.	01505 A17	FD	0*LINES PARALLEL TO RA(0),DFC(1)	01541	21162 31230
				01542	05250 62706
				01543	21211 22105
				01544	31240 52706
				01545	51244 05611
				01546	12105 16140
.	01506		77777 77777	01547	77777 77777
.	01507 A18	FD	0*AL-ACR BOX SCAN	01550	06214 10610
				01551	27050 72435
				01552	05301 00623
.	01510		77777 77777	01553	77777 77777
.	01511 A19	FD	0*LINES PARALLEL TO ORBIT(0),ACROSS ORBIT(1)	01554	21162 31230
				01555	05250 62706
				01556	21211 22105
				01557	31240 52427
				01560	07163 15124
				01561	40560 61027
				01562	24303 00524
				01563	27071 63151
				01564	61400 00000
.	01512		77777 77777	01565	77777 77777
.	01513 A20	FD	0*SCANS CLEARED	01566	30100 62330
				01567	05102 11206
				01570	27121 10000
.	01514		77777 77777	01571	77777 77777
.	01515 A21	FD	0*SCANS HELD	01572	30100 62330
				01573	05151 22111
.	01516		77777 77777	01574	77777 77777
.	01517 A22	FD	0*SCANS SET TO END	01575	30100 62330
				01576	05301 23105
				01577	31240 51223
				01600	11000 00000
.	01520		77777 77777	01601	77777 77777
.	01521 A23	FD	0*SCANS SET TO OTHER END	01602	30100 62330
				01603	05301 23105
				01604	31240 52431
				01605	15122 70512
				01606	23110 00000
.	01522		77777 77777	01607	77777 77777
.	01523 A24	FD	0*SCANS RELEASED	01610	30100 62330
				01611	05271 22112
				01612	06301 21100
.	01524		77777 77777	01613	77777 77777
.	01525 AZZY2	FD	1*A	01614	06050 50505
.	01526	-0	PYT2	01615	77777 01621
.	01527 PYT1	FD	0*AZ OFFSET	01616	06370 52413
				01617	13301 23100
.	01530	-0	-0	01620	77777 77777
.	01531 PYT2	FD	0*OFFSET IN DEGREES	01621	24131 33012
				01622	31051 62305
				01623	11121 42712
				01624	12300 00000
.	01532	-0	-0	01625	77777 77777
.	01533 PYT3	FD	0*EL OFFSET	01626	12210 52413
				01627	13301 23100
.	01534	-0	-0	01630	77777 77777
.	01535 PYT4	FD	0*RA OFFSET	01631	27060 52413

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 .    01536              -0   -0                                     01632   13301 23100
 .    01537 PYT5         FD   0*DEC OFFSET                           01633   77777 77777
                                                                    01634   11121 00524
 .    01540              -0   -0                                     01635   13133 01231
 .    01541 PYT6         FD   0*ACROSS OFFSET                        01636   77777 77777
                                                                    01637   06102 72430
                                                                    01640   30052 41313
 .    01542              -0   -0                                     01641   30123 10000
 .    01543 PYT7         FD   0*ALONGS OFFSET                        01642   77777 77777
                                                                    01643   06212 42314
                                                                    01644   30052 41313
 .    01544              -0   -0                                     01645   30123 10000
 .    01545 FR16         FD   0*CLEARED-RESELECT AT WILL             01646   77777 77777
                                                                    01647   10211 20627
                                                                    01650   12114 12712
                                                                    01651   30122 11210
                                                                    01652   31050 63105
 .    01546              -0                                          01653   34162 12100
 .    01547 FR17         FD   0*HELD-RESELECT AT WILL                01654   77777 77777
                                                                    01655   15122 11141
                                                                    01656   27123 01221
                                                                    01657   12103 10506
                                                                    01660   31053 41621
 .    01550              -0                                          01661   21000 00000
 .    01551 FR17A        FD   0*RESUMED-RESELECT AT WILL             01662   77777 77777
                                                                    01663   27123 03222
                                                                    01664   12114 12712
                                                                    01665   30122 11210
                                                                    01666   31050 63105
 .    01552              -C                                          01667   34162 12100
 .    01553 FR18         FD   0*SCANNING-RESELECT AT WILL            01670   77777 77777
                                                                    01671   30100 62323
                                                                    01672   16231 44127
                                                                    01673   12301 22112
                                                                    01674   10310 50631
 .    01554              -0                                          01675   05341 62121
 .    01555 FR19         FD   0*OFFSET-RESELECT AT WILL              01676   77777 77777
                                                                    01677   24131 33012
                                                                    01700   31412 71230
                                                                    01701   12211 21031
                                                                    01702   05063 10534
                                                                    01703   16212 10000
 .    01556              -0                                          01704   77777 77777
 .    01557 AZZY1        FD   1*A                                    01705   06050 50505
 .    01560              -0   FR20                                   01706   77777 02033
 .    01561 AZZY4        FD   1*A                                    01707   06050 50505
 .    01562              -0   FR21                                   01710   77777 02040
 .    01563 AZZY5        FD   1*A                                    01711   06050 50505
 .    01564              -0   FR22                                   01712   77777 02045
 .    01565 AZZY6        FD   1*A                                    01713   06050 50505
 .    01566              -0   FR23                                   01714   77777 02052
 .    01567 AZZY7        FD   1*A                                    01715   06050 50505
 .    01570              -0   FR24                                   01716   77777 02060
 .    01571 AZZY8        FD   1*A                                    01717   06050 50505
 .    01572              -0   FR25                                   01720   77777 02066
 .    01573 FR1          FD   0*ARC IN DEGREES                       01721   06271 00516
                                                                    01722   23051 11214
                                                                    01723   27121 23000
 .    01574              -0                                          01724   77777 77777
```

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 .    01575 FR2        FD   0*SELECT SCAN OR OFFSET        01725  30122 11210
                                                          01726  31053 01006
                                                          01727  23052 42705
                                                          01730  24131 33012
                                                          01731  31000 00000
 .    01576            403                                01732  00000 00403
 .    01577 FR3        FD   0*CLEAR(0),HOLD(1),RESUME(2)  01733  10211 20627
                                                          01734  51244 05615
                                                          01735  24211 15161
                                                          01736  40562 71230
                                                          01737  32221 25162
                                                          01740  40000 00000
 .    01600            403                                01741  00000 00403
 .    01601 FR4        FD   6*AZSCAN(3),ELSCAN(4),AZELBOX(5)  01742  06373 01006
                                                          01743  23516 34056
                                                          01744  12213 01006
                                                          01745  23516 44056
                                                          01746  06371 22107
                                                          01747  24355 16540
 .    01602            FD   0*,AZOFFSET(6),ELOFFSET(7)    01750  56063 72413
                                                          01751  13301 23151
                                                          01752  66405 61221
                                                          01753  24131 33012
                                                          01754  31516 74000
 .    01603            403                                01755  00000 00403
 .    01604 FR5        FD   6*RASCAN(8),DECSCAN(9),RADECBOX(  01756  27063 01006
                                                          01757  23517 04056
                                                          01760  11121 03010
                                                          01761  06235 17140
                                                          01762  56270 61112
                                                          01763  10072 43551
 .    01605            FD   0*10),RAOFFSET(11),DECOFFSET(12)  01764  61244 05627
                                                          01765  06241 31330
                                                          01766  12315 16161
                                                          01767  40561 11210
                                                          01770  24131 33012
                                                          01771  31516 16240
 .    01606            403                                01772  00000 00403
 .    01607 FR6        FD   6*ORBIT- CROSSCAN(13),ALONGSCAN(  01773  24270 71631
                                                          01774  41051 02724
                                                          01775  30301 00623
                                                          01776  51616 34056
                                                          01777  06212 42314
                                                          02000  30100 62351
 .    01610            FD   0*14),BOX(15),CROSSOFFSET(16),ALONG  02001  61644 05607
                           OFFSET(17)
                                                          02002  24355 16165
                                                          02003  40561 02724
                                                          02004  30302 41313
                                                          02005  30123 15161
                                                          02006  66405 60621
                                                          02007  24231 42413
                                                          02010  13301 23151
                                                          02011  61674 00000
 .    01611            403                                02012  00000 00403
 .    01612            FD   0*DRIFT SCAN(18)              02013  11271 61331
                                                          02014  05301 00623
                                                          02015  51617 04000
 .    01613            -0                                 02016  77777 77777
```

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·   01614 JOHNJ     FD   1*A                                  02017  06050 50505
·   01615           -0   FR2                                  02020  77777 01725
·   01616 FR11A     FD   1*A                                  02021  06050 50505
·   01617           -0   FR16                                 02022  77777 01647
·   01620 FR12      FD   1*A                                  02023  06050 50505
·   01621           -0   FR17                                 02024  77777 01655
·   01622 FR13      FD   1*A                                  02025  06050 50505
·   01623           -0   FR17A                                02026  77777 01663
·   01624 FR14      FD   1*A                                  02027  06050 50505
·   01625           -0   FR18                                 02030  77777 01671
·   01626 FR15      FD   1*A                                  02031  06050 50505
·   01627           -0   FR19                                 02032  77777 01677
·   01630 FR20      FD   0*AZ OFFSET IN DEGREES               02033  06370 52413
                                                              02034  13301 23105
                                                              02035  16230 51112
                                                              02036  14271 21230
·   01631           -0                                        02037  77777 77777
·   01632 FR21      FD   0*EL OFFSET IN DEGREES               02040  12210 52413
                                                              02041  13301 23105
                                                              02042  16230 51112
                                                              02043  14271 21230
·   01633           -0                                        02044  77777 77777
·   01634 FR22      FD   0*RA OFFSET IN DEGREES               02045  27060 52413
                                                              02046  13301 23105
                                                              02047  16230 51112
                                                              02050  14271 21230
·   01635           -0                                        02051  77777 77777
·   01636 FR23      FD   0*DEC OFFSET IN DEGREES              02052  11121 00524
                                                              02053  13133 01231
                                                              02054  05162 30511
                                                              02055  12142 71212
                                                              02056  30000 00000
·   01637           -0                                        02057  77777 77777
·   01640 FR24      FD   0*CROSS-ORBIT OFFSET (DEG)           02060  10272 43030
                                                              02061  41242 70716
                                                              02062  31052 41313
                                                              02063  30123 10551
                                                              02064  11121 44000
·   01641           -0                                        02065  77777 77777
·   01642 FR25      FD   0*ALONG-ORBIT OFFSET (DEG)           02066  06212 42314
                                                              02067  41242 70716
                                                              02070  31052 41313
                                                              02071  30123 10551
                                                              02072  11121 44000
·   01643           -0                                        02073  77777 77777
·   01644 FR26      FD   1*A                                  02074  06050 50505
·   01645           0    FR27                                 02075  00000 02100
·   01646           FD   1*A                                  02076  06050 50505
·   01647           -0   FR18+2                               02077  77777 01673
·   01650 FR27      FD   2*DRIFTING-R                         02100  11271 61331
                                                              02101  16231 44127
·   01651           -0                                        02102  77777 77777
·   01652 PCOUT1    FD   0*A                                  02103  06000 00000
·   01653           -0   PMSG1                                02104  77777 02105
·   01654 PMSG1     FD   0*CARRIAGE RETURN TO START DRIFT SC  02105  10062 72716
                    AN
                                                              02106  06141 20527
                                                              02107  12313 22723
                                                              02110  05312 40530
```

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```
.    01655                      -0
.    01656 PCIN1          FD     1*D
.    01657                 0      $+1
.    01660 FFF             0      0
.    01661 FFFF            0      0
.    01662 DRIFTFLAG       0
.    01663 DRFTAZ          0
.    01664 DRFTEL          0
.    01665 M11             0
.    01666                 RESERVE    1
```

```
02111    31062 73105
02112    11271 61331
02113    05301 00623
02114    77777 77777
02115    11050 50505
02116    00000 02117
02117    00000 00000
02120    00000 00000
02121    00000 00000
02122    00000 00000
02123    00000 00000
02124    00000 00000
02125    00000 00000
02126    26602 66000
02127    02000 00000
02130    02026 60266
02131    00026 60266
02132    00013 30133
02133    00042 10421
02134    00070 70707
02135    25252 52525
02136    00210 42104
```

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	SCAN		CROWTHER*4APR66		
LABEL	LOC	LABEL	LOC	LABEL	LOC
A$$$$$1111	02126	A$$$$$1112	00663	A$$$$$1113	02127
A$$$$$1114	02130	A$$$$$1115	02131	A$$$$$1116	00777
A$$$$$1117	02132	A$$$$$1118	02133	A$$$$$1119	02134
A$$$$$111A	02135	A$$$$$111B	02136	A03	01451
A04	01454	A05	01460	A06	01465
A07	01470	A08	01473	A09	01476
A10	01502	A11	01506	A12	01512
A13	01516	A14	01522	A15	01526
A16	01535	A17	01541	A18	01550
A19	01554	A20	01566	A21	01572
A22	01575	A23	01602	A24	01610
ACQAZIM	63071	ACQELEV	63075	ACQUI	63427
ACTUALTIME	63142	ADSCN	63416	AEBOX	01277
AEBOXLINES	63507	AESCN	63417	ALNGOFFSET	63517
ALNGACRSCN	63506	ANC	63070	ANS	63066
ARCOFAZIM	63524	ARCOFDEC	63526	ARCOFELEV	63522
ARCUFRA	63530	ASTRODEC	63106	ASTRORA	63105
AUPEREQUAT	63341	AUTOSWITCH	63025	AUTOT	63437
AYRD	01131	AZ1	63053	AZ2	63055
AZDIFS	63120	AZELOTIME	63532	AZELBXSCAN	63500
AZELIND$	63162	AZIM	63053	AZIMOFFSET	63512
AZIMOUT	64000	AZIMOVER	63325	AZIMADD	63442
AZIMERROR$	63027	AZIMIN	75000	AZMTHSCAN	63501
AZTRACKERR	63022	AZZY1	01705	AZZY2	01614
AZZY4	01707	AZZY5	01711	AZZY6	01713
AZZY7	01715	AZZY8	01717	BODYSIZE	63462
BOX	01323	BOXOUT1	01335	BOXOUT2	01336
BKANDFORTH	01044	BLASTOFF	63146	COCON	63414
CONVERTIME	63135	CORCT	63420	COSORIENT	63065
COSAZEL	63070	CAZIM	63060	CELBODY	63113
CELCOMPGM	63424	CELEV	63061	CELTIME	63133
CHCOR	63422	CHPAR	63431	CRANGE	63057
CRSSOFFSET	63516	DOBOX	01144	DOBOX1	01200
DOPPOUT	66000	DOPPADD	63444	DATANALYZE	63425
DAY	63150	DEC	63003	DECOFFSET	63515
DECDOT	63010	DECLINSCAN	63505	DELTATEE	63316
DN1	63003	DN2	63005	DRFTAZ	02122
DRFTEL	02123	DRIFTFLAG	02121	DSECONDS	63141
DUMSECTTG	63154	DYDMP	63421	EL1	63054
EL2	63056	ELO1FS	63121	ELEV	63054
ELEVOFFSET	63513	ELEVOUT	65000	ELEVADD	63443
ELEVERROR$	63030	ELEVIN	76000	ELTRACKERR	63023
ELVTNSCAN	63502	ENDTIM	01264	EQUATOR	63323
ESTSHIFTED	63143	EXPNAME	63350	FFF	02117
FFFF	02120	FIRSTELEV	63104	FIRSTHRU	63153
FIXZERO	01074	FLATTENING	63337	FR1	01721
FR11A	02021	FR12	02023	FR13	02025
FR14	02027	FR15	02031	FR16	01647
FR17	01655	FR17A	01663	FR18	01671
FR19	01677	FR2	01725	FR20	02033
FR21	02040	FR22	02045	FR23	02052
FR24	02060	FR25	02066	FR26	02074

FR27	02100	FR3	01733	FR4	01742
FR5	01756	FR6	01773	FRAMESIZE	63101
FREQUENCY	63317	FYRD	01126	GEOCENLAT	63322
GEODETLAT	63321	GMTMODU24	63145	GMTSHIFTED	63144
HOLDNUHOLD	63511	HOURMINUTE	63137	HOURREG	63151
HEIGHT	63326	I01	01337	I02	01347
I03	01353	I14	01373	I15	01377
I16	01403	I17	01407	I18	01413
IC	63426	ID10RADIO	66777	ID11RADIO	67776
ID12RADIO	67777	ID13RADIO	70775	ID14RADIO	70776
ID15RADIO	71776	ID16RADIO	71777	ID17RADIO	72776
ID18RADIO	72777	ID19RADIO	73776	ID1CELCOR	63000
ID1ENTPNT	63410	ID1RADCOR	63050	ID1RADIO	63440
ID1RECRD	63210	ID1SYSENT	77576	ID1SYSNAM	77676
ID1SYSPAR	63310	ID1TIME	63130	ID20RADIO	73777
ID21RADIO	74776	ID22RADIO	74777	ID23RADIO	75776
ID24RADIO	75777	ID25RADIO	76775	ID26RADIO	76776
ID2CELCOR	63001	ID2ENTPNT	63411	ID2RADCOR	63051
ID2RADIO	63441	ID2RECRD	63211	ID2SYSENT	77577
ID2SYSNAM	77677	ID2SYSPAR	63311	ID2TIME	63131
ID3RADIO	63776	ID4RADIO	63777	ID5RADIO	64776
ID6RADIO	64777	ID7RADIO	65776	ID8RADIO	65777
ID9RADIO	66776	INAZIMADD	63446	INELEVADD	63447
INTER	63413	INTERAZIM	72000	INTERCOM	63426
INTERDOPP	74000	INTERELEV	73000	INTERLCKSW	63460
INTERRANGE	76777	JOHND	02017	JPTAB	00016
KAL	63524	KAT	63523	KDL	63526
KDT	63525	KEL	63522	KET	63521
KIND	01263	KKAL	63512	KKCL	63516
KKDL	63515	KKEL	63513	KKLL	63517
KKRL	63514	KMPERNM	63342	KRL	63530
KRT	63527	KYBRDLEVEL	63110	KYBRDSPEC1	63344
KYBRDSPEC2	63345	KYBRDSPEC3	63346	KYBRDSPEC4	63347
KYRD	01116	L	01043	LONGITUDE	63320
LINE	01212	LINE1	01221	LINE2	01243
LINE3	01250	LINE4	01260	LINECOUNT$	63127
LINEX	01230	LSPERAU	63336	LYRD	01137
MOONSW$	63343	MODESWITCH	63024	M1	63500
M10	63511	M11	02124	M2	63501
M3	63502	M4	63503	M5	63504
M6	63505	M7	63506	M8	63507
M9	63510	MAINSWITCH	63334	MC0	00041
MC1	00047	MC10	00506	MC13	00515
MC14	00525	MC15	00533	MC16	00541
MC17	00551	MC18	00561	MC19	00567
MC2	00100	MC20	00577	MC20A	00602
MC3	00127	MC4	00206	MC5	00236
MC6	00266	MC7	00346	MC8	00376
MC9	00426	MCPC	00614	MCPFILLER	71000
MCPGM	63412	MCQ3	00075	MCQQ	00014
MCR	00012	MCXX	00574	MILLSTNADD	63451
MINREG	63152	MSFREQ	63332	NMPERAU	63340
NULL	63531	NULLY	63532	POLE	63324
P10	01066	P2	00714	P3	01022
P4	01014	P5	00700	P6	00747
P7	00706	PCOUT1	02103	PCIN1	02115
PER10DAZIM	63523	PERIODDEC	63525	PERIODELEV	63521
PERIODRA	63527	PLOTAZIM$$	63020	PLOTELEV$$	63021
PLOTP	63436	PLANP	63434	PMSG1	02105

Symbol	Address	Symbol	Address	Symbol	Address
PPUT	00743	PREVIOUSTM	63461	PR1NRECSW	63160
PRLOG	63423	PYRD	01132	PYT1	01616
PYT2	01621	PYT3	01626	PYT4	01631
PYT5	01634	PYT6	01637	PYT7	01643
RA	63002	RAOFFSET	63514	RA1	63002
RA2	63004	RADOT	63007	RADARMODE	63312
RADCBXSCAN	63503	RADECOT1ME	63531	RAD1ODEC	63541
RADIOMETER	63102	RAD1ORA	63540	RADIND1C	63157
RAD1US	63006	RAD1USDOT	63011	RANGE	63052
RANGEOUT	70777	RANGEADD	63445	RANGEDOT	63062
RASCTNSCAN	63504	RDOTD1FS	63123	RDBOX	01311
RDBOXL1NES	63510	RDIFS	63122	RDMTR	63430
RDXXX	63433	RECORDS1ZE	63112	RECAZIM	67000
RECELEV	70000	RECF1LE	63212	RECRD	63415
RECRDSWTCH	63155	REFRACINDS	63161	RELEASESW	63156
S	01265	S02	01343	S03	01351
S04	01355	S06	01357	S08	01361
S10	01363	S12	01365	S14	01367
S15	01375	S16	01401	S17	01405
S18	01411	S24	01415	S28	01417
S34	01421	S38	01423	S40	01425
S41	01427	S42	01431	S43	01433
S44	01435	S51	01345	S52	01371
S61	01437	S62	01441	S63	01443
S64	01445	S65	01447	SAZ1M	63055
SCAN	00003	SCAN1	00760	SCAN2	00756
SCAN20	00617	SCANX	00000	SCELT1ME	63134
SDEC	63005	SECONDS	63140	SELEV	63056
S1DERT1ME	63012	SINOR1ENT	63064	S1NAZEL	63066
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SLAVEMODES	63125	SRA	63004	SRADTIME	63136
SYNCT1M1NG	63542	SYSCOMREG1	63452	SYSCOMREG2	63453
SYSCOMREG3	63454	SYSCOMREG4	63455	SYSCOMREG5	63456
SYSCOMREG6	63457	SYSENTR1ES	77600	SYSNAMES	77700
SYSTAT1	63313	SYSTAT2	63314	SYSTATD	63315
T	01033	T0	01034	TOME	63520
T1	01035	T2	01036	T3	01037
T4	01040	T5	01041	T6	01042
TEMP	01031	TEMP1	01032	T1MECORR	63107
TIMEMODE	63103	TIMEP	63435	TIMETOHOLD	63520
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V1ZDEC1	63014	V1ZDEC2	63016	VIZRA1	63013
VIZRA2	63015	WFORD	63432	WFADD	63450
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ZZ2	01267	ZZ22	01274	ZZ3	01270
ZZ33	01275	ZZ4	01271	ZZ44	01276
ZZ5	01272				

	SCAN		CROWTHER*4APR66		
LABEL	LOC	LABEL	LOC	LABEL	LOC
SCANX	00000	TT	00002	SCAN	00003
MCR	00012	MCQQ	00014	JPTAB	00016
MCO	00041	MC1	00047	MCQ3	00075
MC2	00100	MC3	00127	MC4	00206
MC5	00236	MC6	00266	MC7	00346
MC8	00376	MC9	00426	MC10	00506
MC13	00515	MC14	00525	MC15	00533
MC16	00541	MC17	00551	MC18	00561
MC19	00567	MCXX	00574	MC20	00577
MC20A	00602	MCPC	00614	SCAN2Q	00617
A$$$$$1112	00663	P5	00700	P7	00706
P2	00714	PPUT	00743	P6	00747
SCAN2	00756	SCAN1	00760	A$$$$$1116	00777
P4	01014	P3	01022	TEMP	01031
TEMP1	01032	T	01033	T0	01034
T1	01035	T2	01036	T3	01037
T4	01040	T5	01041	T6	01042
L	01043	BKANDFORTH	01044	P10	01066
FIXZERO	01074	KYRD	01116	FYRD	01126
AYRD	01131	PYRD	01132	TYRD	01133
LYRD	01137	DOBOX	01144	DOBOX1	01200
LINE	01212	LINE1	01221	LINEX	01230
LINE2	01243	LINE3	01250	LINE4	01260
KIND	01263	ENDTIM	01264	S	01265
ZZ1	01266	ZZ2	01267	ZZ3	01270
ZZ4	01271	ZZ5	01272	ZZ11	01273
ZZ22	01274	ZZ33	01275	ZZ44	01276
A&BOX	01277	RDBOX	01311	BOX	01323
BOXOUT1	01335	BOXOUT2	01336	I01	01337
S02	01343	S51	01345	I02	01347
S03	01351	I03	01353	S04	01355
S06	01357	S08	01361	S10	01363
S12	01365	S14	01367	S52	01371
I14	01373	S15	01375	I15	01377
S16	01401	I16	01403	S17	01405
I17	01407	S18	01411	I18	01413
S24	01415	S28	01417	S34	01421
S38	01423	S40	01425	S41	01427
S42	01431	S43	01433	S44	01435
S61	01437	S62	01441	S63	01443
S64	01445	S65	01447	A03	01451
A04	01454	A05	01460	A06	01465
A07	01470	A08	01473	A09	01476
A10	01502	A11	01506	A12	01512
A13	01516	A14	01522	A15	01526
A16	01535	A17	01541	A18	01550
A19	01554	A20	01566	A21	01572
A22	01575	A23	01602	A24	01610
AZZY2	01614	PYT1	01616	PYT2	01621
PYT3	01626	PYT4	01631	PYT5	01634
PYT6	01637	PYT7	01643	FR16	01647
FR17	01655	FR17A	01663	FR18	01671

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Name	Value	Name	Value	Name	Value
FR19	01677	AZZY1	01705	AZZY4	01707
AZZY5	01711	AZZY6	01713	AZZY7	01715
AZZY8	01717	FR1	01721	FR2	01725
FR3	01733	FR4	01742	FR5	01756
FR6	01773	JOHND	02017	FR11A	02021
FR12	02023	FR13	02025	FR14	02027
FR15	02031	FR20	02033	FR21	02040
FR22	02045	FR23	02052	FR24	02060
FR25	02066	FR26	02074	FR27	02100
PCOUT1	02103	PMSG1	02105	PCIN1	02115
FFF	02117	FFFF	02120	DRIFTFLAG	02121
DRFTAZ	02122	DRFTEL	02123	M11	02124
A$$$$$1111	02126	A$$$$$1113	02127	A$$$$$1114	02130
A$$$$$1115	02131	A$$$$$1117	02132	A$$$$$1118	02133
A$$$$$1119	02134	A$$$$$111A	02135	A$$$$$111B	02136
ID1CELCOR	63000	ID2CELCOR	63001	RA1	63002
RA	63002	DN1	63003	DEC	63003
SRA	63004	RA2	63004	SDEC	63005
DN2	63005	RADIUS	63006	RADOT	63007
DECDOT	63010	RADIUSDOT	63011	SIDERTIME	63012
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VIZDEC2	63016	TWOSECDOP	63017	PLOTAZIM$$	63020
PLOTELEV$$	63021	AZTRACKERR	63022	ELTRACKERR	63023
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AZ1	63053	ELEV	63054	EL1	63054
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CELEV	63061	RANGEDOT	63062	TRUERANGE	63063
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SINAZEL	63066	ANC	63070	COSAZEL	63070
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ESTSHIFTED	63143	GMTSHIFTED	63144	GMTMODU24	63145
BLASTOFF	63146	YEARMONTH	63147	DAY	63150
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SYSTATD	63315	DELTATEE	63316	FREQUENCY	63317
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FLATTENING	63337	NMPERAU	63340	AUPEREQUAT	63341
KMPERNM	63342	MOONSW$	63343	KYBRDSPEC1	63344

Name	Addr	Name	Addr	Name	Addr
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EXPNAME	63350	ID1ENTPNT	63410	ID2ENTPNT	63411
MCPGM	63412	INTER	63413	COCON	63414
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PLOTP	63436	AUTOT	63437	ID1RADIO	63440
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DOPPADD	63444	RANGEADD	63445	INAZIMADD	63446
INELEVADD	63447	WFADD	63450	MILLSTNADD	63451
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SYSCOMREG4	63455	SYSCOMREG5	63456	SYSCOMREG6	63457
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AZELBXSCAN	63500	M1	63500	M2	63501
AZMTHSCAN	63501	M3	63502	ELVTNSCAN	63502
RADCBXSCAN	63503	M4	63503	M5	63504
RASCTNSCAN	63504	M6	63505	DECLINSCAN	63505
ALNGACRSCN	63506	M7	63506	M8	63507
AEBOXLINES	63507	RDBOXLINES	63510	M9	63510
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AZIMOFFSET	63512	KKEL	63513	ELEVOFFSET	63513
RAOFFSET	63514	KKRL	63514	KKDL	63515
DECOFFSET	63515	CRSSOFFSET	63516	KKCL	63516
KKLL	63517	ALNGOFFSET	63517	TIMETOHOLD	63520
TOME	63520	PERIODELEV	63521	KET	63521
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KDT	63525	PERIODDEC	63525	KDL	63526
ARCOFDEC	63526	KRT	63527	PERIODRA	63527
ARCOFRA	63530	KRL	63530	RADECOTIME	63531
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ID5RADIO	64776	ID6RADIO	64777	ELEVOUT	65000
ID7RADIO	65776	ID8RADIO	65777	DOPPOUT	66000
ID9RADIO	66776	ID10RADIO	66777	RECAZIM	67000
ID11RADIO	67776	ID12RADIO	67777	RECELEV	70000
ID13RADIO	70775	ID14RADIO	70776	RANGEOUT	70777
MCPFILLER	71000	ID15RADIO	71776	ID16RADIO	71777
INTERAZIM	72000	ID17RADIO	72776	ID18RADIO	72777
INTERELEV	73000	ID19RADIO	73776	ID20RADIO	73777
INTERDOPP	74000	ID21RADIO	74776	ID22RADIO	74777
AZIMIN	75000	ID23RADIO	75776	ID24RADIO	75777
ELEVIN	76000	ID25RADIO	76775	ID26RADIO	76776
INTERRANGE	76777	ID1SYSENT	77576	ID2SYSENT	77577
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13. ABSTRACT

As one of its options, the Haystack Pointing System can superpose
a scan on any other pointing task. The available scans include both
simple one-dimensional scans and area-covering scans.

14. KEY WORDS

Haystack Pointing System
antenna pointing